

1 **STATE OF ILLINOIS**
2 **ILLINOIS COMMERCE COMMISSION**
3 **DOCKET NO. 00-0393**

4
5 **DIRECT TESTIMONY ON REHEARING OF DR. NIEL RANSOM**
6 **OF ALCATEL USA, INC.**
7

8 **Q. PLEASE STATE YOUR NAME AND BY WHOM YOU ARE EMPLOYED.**

9
10 A. My name is Dr. Niel Ransom. I am a resident of Rolesville, North Carolina, employed as
11 the Chief Technology Officer (CTO) for Alcatel USA, Incorporated. I am an authorized
12 representative of Alcatel USA ("Alcatel").

13 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

14 ~~A. I am filing this testimony in response to the Commission's March 14, 2001 Order in~~
15 ~~Docket No. 00-0393 ("Order"), particularly the requirements that Ameritech Illinois~~
16 ~~permit CLECs to designate and place their own line cards in Project Pronto facilities used~~
17 ~~for Digital Subscriber Line ("DSL") service, and provide many pieces of the Project~~
18 ~~Pronto network as "unbundled network elements." As I discuss, to the extent that~~
19 ~~Ameritech Illinois deploys Alcatel's Litespan 2000 Next Generation Digital Loop Carrier~~
20 ~~("NGDLC") systems as part of Project Pronto, line cards from other manufacturers would~~
21 ~~not work in those systems and could threaten the reliability of service in those systems. I~~
22 ~~also address other technical issues that relate to Alcatel's equipment and the impact of the~~
23 ~~Commission's Order. Finally, I address Questions 6-8 of the list of questions posed by~~
24 ~~Commissioner Squires.~~

25 **Q. WHAT IS ALCATEL'S INTEREST IN THIS PROCEEDING?**

26 A. Alcatel builds next generation networks, delivering integrated end-to-end voice and data
27 networking solutions to established and new carriers, as well as enterprises and consumers
28 worldwide. Alcatel has been chosen as the primary vendor for the NGDLC systems that

1 Ameritech Illinois planned to deploy in Illinois. In addition, Alcatel is a vendor of NGDLC
2 systems for Project Pronto in other states, and would like to be a provider of such equipment
3 to other carriers as well. ~~The Commission's Order, however, could threaten the ability of~~
4 ~~manufacturers of such equipment to compete on the merits of their technology, by~~
5 ~~effectively requiring some kind of "standardization" of equipment.~~

6 ~~Q. HAVE YOU AND ALCATEL ADDRESSED THESE ISSUES AND CONCERNS IN~~
7 ~~OTHER FORUMS?~~

8
9 ~~A. Yes. Alcatel filed comments with the Federal Communications Commission ("FCC") on~~
10 ~~October 12, 2000 regarding the FCC's Order on Reconsideration and Second Further Notice~~
11 ~~of Proposed Rulemaking in CC Docket No. 98-147 and Fifth Further Notice of Proposed~~
12 ~~Rulemaking in CC Docket No. 96-98. Alcatel also filed reply comments with the FCC on~~
13 ~~November 14, 2000 regarding the FCC's Second Further Notice of Proposed Rulemaking~~
14 ~~proceeding on Deployment of Wireline Services Offering Advanced Telecommunications~~
15 ~~Capability in CC Docket No. 98-147 and Implementation of Local Competition Provisions~~
16 ~~of the Telecommunications Act of 1997 in CC Docket No. 96-98. I have attached these~~
17 ~~FCC filings to this testimony as Schedules NR-1 and NR-2, respectively, and incorporate~~
18 ~~them into this testimony by reference.~~

19 ~~Q. PLEASE SUMMARIZE THE FCC FILINGS YOU ARE INCORPORATING BY~~
20 ~~REFERENCE.~~

21
22 ~~A. In the FCC filings, Alcatel commented on the use of foreign or non-authorized line cards (or~~
23 ~~"plug-ins") in Litespan® NGDLC systems. As Alcatel's FCC filings explain, it is not~~
24 ~~technically feasible to install line cards not manufactured or licensed by Alcatel in its~~
25 ~~systems. Furthermore, as is the case with other internal system components, it is not~~
26 ~~possible to directly access or interconnect with these line cards. Access is only possible~~

1 through the derived (or “virtual”) facilities and service lines supported by the systems.

2 Therefore, Alcatel believes that a line card should not be treated as a separate “unbundled
3 network element,” and neither physical nor virtual line card collocation is appropriate.

4
5 In our FCC filings, Alcatel noted a variety of reasons why it is **not** technically feasible to
6 install line cards designed for other systems into our system, including, but not limited to the
7 following: board and system physical hardware designs, powering requirements, thermal
8 dissipation, software interoperability, and the use of restricted proprietary, copyright-
9 protected intellectual property. If one were to attempt to place a line card designed for other
10 systems in our system, the card in all likelihood would not physically fit correctly into the
11 card guides nor interconnect properly with our backplane electrical pins. If, by chance, one
12 were able to physically get another manufacturer’s card plugged into the backplane, it would
13 not inter-operate with our system and element management software, as would be required
14 for service provisioning, surveillance and maintenance. If another manufacturer were to
15 attempt to design a compatible line card for our system, installing it would void our system’s
16 warranties. There also is a very high probability that it would cause damage to the system
17 and disrupt service. Developing a new line card to operate in Alcatel’s or other
18 manufacturers’ systems requires detailed knowledge of the proprietary internal design of the
19 system, and associated changes by the system’s manufacturer to the software of the system’s
20 controller and element management system.

21 ~~Q. WOULD CLEC OWNERSHIP OF LINE CARDS CAUSE ANY OTHER PROBLEMS?~~

22
23 ~~A. Yes. As I noted above, it is not technically feasible to install line cards not manufactured or~~
24 ~~licensed by Alcatel in our systems. In addition, the channel bank assemblies (CBAs) in a~~

1 ~~remote terminal are cabled directly to cable binder groups serving individual SAIs. As a~~
2 ~~result, when an ADLU line card is installed in a CBA, all of the lines supported by the card~~
3 ~~are cabled to the SAI. If the cards were individually owned, significant inefficiencies could~~
4 ~~arise, because unassigned lines on one CLEC's ADLU line card could not be used by other~~
5 ~~CLECs or by Ameritech Illinois. I further note that the Alcatel Litespan ADLU cards are~~
6 ~~combination cards, supporting both POTS and ADSL. Not only would ADSL efficiency be~~
7 ~~significantly reduced, but the system capacity for basic services would also be substantially~~
8 ~~decreased.~~

9 ~~Q. DO LINE CARDS USED IN THE ALCATEL NGDLCs HAVE ANY FUNCTIONALITY~~
10 ~~OF THEIR OWN, AND ARE THEY ACCESSIBLE FOR "CONNECTION" WITH~~
11 ~~ANOTHER CARRIER'S NETWORK?~~
12

13 ~~A. The answer to both questions is no. I should also point out that installation of the ADLU~~
14 ~~card itself does not establish service, nor are there any physical points of access on the cards~~
15 ~~for interconnection with other carriers. The system's software is needed to provision the~~
16 ~~card, monitor its call states, and perform other surveillance and maintenance functions. The~~
17 ~~software's Right to Use (the intellectual property right) has been licensed to and purchased~~
18 ~~by Ameritech Illinois. It cannot be modified or used by others. Thus, the only technically~~
19 ~~feasible points of service interconnection are at the OCD in the central office on one end~~
20 ~~and, at the other end, beyond the RT, at either the SAI (if the CLEC has its own connecting~~
21 ~~distribution facilities), or at the end-user customer NID.~~
22
23

1 ~~Q. DO YOU ALSO HAVE CONCERNS REGARDING THE ORDER'S REQUIREMENT~~
2 ~~THAT AMERITECH ILLINOIS PROVIDE VARIOUS PIECES OF THE PRONTO DSL~~
3 ~~ARCHITECTURE AS "UNEs"?~~

4
5 ~~A. Yes. Of first note is the Order's creation of the UNE "Lit Fiber Subloops between the RT~~
6 ~~and the OCD in the CO consisting of one or more PVPs (permanent virtual paths) and/or~~
7 ~~one or more PVCs (permanent virtual circuits) at the option of the CLEC." The Alcatel~~
8 ~~Litespan system that Ameritech Illinois had planned to deploy does not have the ability to~~
9 ~~provide this capability. The Litespan system terminates the ATM fiber on the system on a~~
10 ~~ATM Bank Control Unit ("ABCU"), which provides one PVP to its associated Channel~~
11 ~~Bank Assembly ("CBA"). All ADLU line cards that are plugged into that CBA must have~~
12 ~~all of their Permanent Virtual Circuits ("PVCs") provisioned to that one PVP. The PVP is~~
13 ~~carried through the ABCU over a single OC-3c fiber path to/from the OCD in the Pronto~~
14 ~~network architecture. Within a system using multiple CBAs to provide DSL service, each~~
15 ~~CBA has its own unique PVP. The CBAs are daisy chained, according to a proprietary~~
16 ~~internal format, to share the OC-3c fiber path between the RT and the OCD. If Ameritech~~
17 ~~Illinois were required to offer the Lit Fiber Subloop UNE at the PVP level, each CLEC~~
18 ~~would have to be given its own, dedicated CBA. This would drastically reduce the~~
19 ~~economic efficiencies compared to sharing CBAs.~~

1 **Q. LET US NOW TURN TO THE QUESTIONS OF COMMISSIONER SQUIRES.**
2 **QUESTION 6 STATES:**

3
4 *Line Card Collocation:* Considering that line cards are utilized by the current loop
5 infrastructure of Ameritech-Illinois and are treated as part and parcel of the UNE
6 loop,¹ please comment on the following:

- 7
8 A) Can and/or should the Commission treat ADLU cards as part of the loop for
9 unbundling purposes?
10
11 B) Is the above interpretation consistent with C.F.R. 47 Section 51.307(c)?²
12
13 C) C.F.R. 47 Section 51.319 provides for an exception to attached electronics for those
14 electronics used for the provision of advanced services, such as Digital Subscriber Line
15 Access Multiplexers. Does the ADLU card qualify for this exception?
16

17 **WHAT IS YOUR RESPONSE?**

18 ~~A. Although I am not a lawyer, I will attempt to address parts (A) and (C) of Question 6. The~~
19 ~~answer to (A) is no and the answer to (C) is yes. Section 51.319 of the FCC's rules identifies~~
20 ~~the local loop as the transmission facility between a distribution frame and the loop~~
21 ~~demarcation point. It explicitly excludes the electronics for providing advanced services (that~~
22 ~~is, the DSL line circuits). The ADLU card contains the DSL line circuit and thus would be~~
23 ~~excluded from the definition of a local loop. In fact, the FCC has already determined that~~
24 ~~ADLU cards were "Advanced Services Equipment" in its Pronto Waiver Order (CC Docket~~
25 ~~No. 98-141, ASD File No. 99-49, released September 8, 2000, at 15).~~

26
27 ~~In any case, the ADLU cards cannot be unbundled as part of the loop as they provide no clear~~
28 ~~demarcation point for unbundling. Instead, the ADLU cards are an integral part of the~~

¹ For example, within its UNE cost studies, Ameritech includes the cost of line cards as an input to the UNE loop, identical to how it treats feeder and distribution cable.

² Section 51.307(c) requires an ILEC to provide all "features, functions, and capabilities" of a UNE "in a manner that allows the requesting telecommunications carrier to provide any telecommunications service that can be offered by means of that network element."

1 ~~Alcatel Litespan 2000/2012 system. It is impossible to make use of the functionality of the~~
2 ~~ADLU cards themselves apart from the functionality of the rest of the Litespan system. The~~
3 ~~interface between the ADLU cards and the rest of the system is not an open interface but is~~
4 ~~rather a complex and proprietary design of Alcatel. The software operation of the system~~
5 ~~includes downloading software through the system controller into these cards to execute in~~
6 ~~concert with the software in the system controller. A “network element” for unbundling~~
7 ~~consideration, then, could be an individual line or circuit supported by the entire system, but~~
8 ~~not an individual component of the system.~~

9
10 ~~Alcatel does not allow access to the internal buses of its Litespan 2000/2012 system and any~~
11 ~~attempt to install unapproved equipment would likely harm the operation of the system and~~
12 ~~would void the warranty of the system.~~

13
14 **Q. QUESTION 7 STATES:**

15
16 ***Line Card Compatibility:*** Please comment on the following regarding line card
17 **compatibility:** (i) is it possible for a CLEC to enter into a partnership with Alcatel
18 **or a licensing agreement with a third-party to engineer different flavors of DSL**
19 **cards than what Ameritech-Illinois chooses to deploy? (ii) are there any established**
20 **industry standards governing line card interchangeability?**
21

22 **WHAT IS YOUR RESPONSE?**

23 A. There are currently no industry standards governing line card interchangeability. Each
24 switching system and each Digital Loop Carrier system of the various manufacturers
25 utilizes unique designs of the line cards. These line cards differ in physical size, the types
26 and sizes of connectors, the functions carried out on the card versus in the common
27 equipment, the formats of signals and operations of the backplane buses, the system

1 control methods, the means of testing and operation, powering requirements, thermal
2 dissipation, etc. Many of these design elements are proprietary to the given
3 manufacturer, are typically implemented in custom-design ASICs (Application Specific
4 Integrated Circuits), and are often protected by patents and copyrights of the
5 manufacturer. The software running on the processor of the common equipment must be
6 crafted to the unique operational characteristics of the various line cards used. Even for a
7 given manufacturer, the design of the line cards often changes in dramatic ways from one
8 generation of equipment to the next, as new technologies are introduced, and as the range
9 of services demanded in the marketplace evolves.

10
11 For a given system and given manufacturer, developing an additional line card, say to
12 introduce a new flavor of DSL, requires detailed knowledge of the system. In addition to
13 the board design itself, this involves making appropriate software modifications in the
14 common control of equipment. In addition, software modifications would be required to
15 the Element Management System (“EMS”) which controls provisioning, administration,
16 surveillance, and maintenance of the system. This development must be done with
17 knowledge of and in joint design with whatever other improvements and additions are
18 being made, or are planned to be made, to the system. Careful regression testing is
19 required to ensure that the introduction of this card does not cause mis-operation of other
20 features of the system. For example, this includes testing to ensure that component
21 layout of the board does not result in the new line card coupling signals into adjacent line
22 cards.

1 It is for the above reasons that it is not possible for a new line card to be developed for a
2 modern digital loop carrier system, such as the Alcatel Litespan system, except by the
3 manufacturer of the system or in a licensing arrangement by another manufacturer
4 working in close collaboration with the system's manufacturer. An example of this latter
5 case is the Alcatel Access Partners Program (AAPP). The AAPP is a program under
6 which Alcatel researches the benefits of licensing the design and build of particular types
7 of Litespan channel units to third party manufacturers. As the needs of our business
8 dictate, we will periodically enter into a Technology License Agreement with another
9 manufacturer. This manufacturer will work in close collaboration with Alcatel on the
10 design and testing of these cards. Those channel units that are licensed are designed
11 solely for use in Litespan systems.

12
13 Alcatel's decision to develop a particular type of line card is a business decision
14 determined by such factors as volume of demand, expected selling margin, competitive
15 pressures, and the availability of development resources. Alcatel products are sold to
16 both the ILEC and CLEC markets, and the demands of each of these markets are taken
17 into account in determining which line cards and features Alcatel develops for its
18 products.

1 **Q. QUESTION 8 STATES:**

2
3 *Points of Interconnection: Please comment on the following:*

- 4
5 A) Describe in detail every technically-feasible point of interconnection or access to sub-
6 components within the NGDLC Ameritech-Illinois is deploying?
7
8 B) Is it technically feasible to cross-connect from the central office fiber distribution frame
9 to a CLEC-collocated ATM switch, thereby allowing a CLEC to bypass the Ameritech-
10 Illinois-owned OCD port? Are there any other technically feasible ways to bypass the
11 ILEC packet switching function?
12
13 C) If Ameritech-Illinois has hard-wired various components of the NGDLC together,
14 please comment on how a CLEC, with collocated stand-alone equipment inside the
15 remote terminal, would access individual copper pairs where NGDLC has been
16 deployed?
17

18 **WHAT IS YOUR RESPONSE?**

19 ~~A. (Response to Part A). There is no feasible point of interconnection or access to sub-~~
20 ~~components of the NGDLC system itself. The primary technically feasible point of~~
21 ~~interconnection for an Alcatel Litespan 2000/2012 system is at the FDI (Feeder Distribution~~
22 ~~Interface) or other accessible terminal located beyond the remote terminal equipment. It is at~~
23 ~~that point that flexible interconnections are made between feeder facilities tied to the~~
24 ~~Litespan system and the distribution facility to the customer. These feeder facilities~~
25 ~~terminate on 25-pair block connectors within the Litespan cabinet (or hut or CEV). These~~
26 ~~connectors do not give access to individual pairs of wires.~~
27
28

29 (Response to Part B). The central office OCD performs a cross-connect function that allows
30 individual ADSL circuits from multiple CBAs to be routed to different carriers. Litespan
31 remote terminals groom the ATM data traffic from the ADLU interfaces to an ATM OC-3c
32 facility for transport to the central office. The interface at each remote terminal is provided

1 through redundant ATM Bank Control Units (“ABCUs”) located in the Channel Bank
2 Assemblies (“CBAs”). Up to 32 ABCUs can be “daisy chained” to the same OC-3c. The
3 OC-3c can be transported over separate fiber facilities (the most popular approach) or, in the
4 case of the Litespan-2012 system, through an OC-3c broadband service interface. In either
5 case, the ATM OC-3c facility can only be terminated at one network element within the
6 central office. Therefore, if it were routed to a collocated ATM switch, all of the ATM traffic
7 in the ABCU chain would be routed to that switch.

8
9 The ABCU chains can be split into individual shelf units with additional OC-3c facilities,
10 but, at the least, that means each OC-3c would be dedicated to 224 ADLU lines (56 slots
11 with four-port ADLU cards) that could not be shared with other providers. There is no other
12 way to bypass the OCD.

13
14 (Response to Part C) The CBAs are factory wired to connectorized stubs that are connected
15 to the protector block stubs. The protector blocks, in turn, are spliced to the derived feeder
16 facilities that extend from the RT site to SAIs beyond the RT, as noted in the response to the
17 previous question. Although collocation within a remote terminal enclosure may be possible
18 in some cases, it will normally be precluded by one or more restraint, including: space,
19 thermal dissipation limits, rectifier capacity and/or lack of separate access (security).

20 However, there may be space for an adjacent cabinet on the same R/W (assuming no permit
21 or easement restrictions) or at a separate location closer to the SAI, in which case, the
22 engineer controlled splice option can provide access to the cable binder groups (access to
23 individual distribution pairs is provided through jumpers at the SAI, assuming there are spare

1 terminal blocks for the additional feeder pairs or space for more to be added). For DSLAMs
2 providing business services (such as SDSL), both space and interconnection usually can be
3 better accommodated with installations in the building terminal rooms or closets. Direct
4 access to the inside wiring is provided at the terminal blocks.

5
6 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY ON REHEARING?**

7 A. Yes.

1

2

3